AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1. (Currently Amended) A method of making a diamond product having a projection or a depression on a surface thereof by etching, said method comprising the steps of:

forming a diamond substrate with a mask layer including a metal layer in at least one part thereof; and

etching said diamond substrate formed with said mask layer with a plasma of a mixed gas composed of a gas containing an oxygen atom and a gas containing a fluorine atom;

wherein said fluorine atom has a concentration within the range of 0.04% to 6% with respect to the total number of atoms in said mixed gas, said plasma is produced by generating a high-frequency discharge between two plate electrodes, said high-frequency discharge is generated by supplying an electric power of less than 1.0 W/cm^2 between said plate electrodes, and said mixed gas further contains nitrogen gas, thereby to form the diamond product having the projection or depression with a side face with an angle of inclination of at least 78 degrees,

wherein said mixed gas contains nitrogen gas in an amount such that the intensity ratio A/B of said mixture is greater than the intensity ratio A/B of ~~pure oxygen~~ the mixed gas with no nitrogen, where A is the intensity of an emission peak caused by atomic oxygen and B is the intensity of an emission peak caused by molecular oxygen.

2. (Cancelled)

3. (Previously Presented) A method of making a diamond product according to claim 1, wherein said gas containing said fluorine atom is CF_4 gas; and

wherein said CF_4 gas has a concentration within the range of 0.02% to 3% with respect to the total number of molecules in said mixed gas.

4. (Original) A method of making a diamond product according to claim 1, wherein said gas containing said oxygen atom is one of O_2, CO_2, and a mixed gas composed of O_2 and CO_2.

Claims 5-11. (Cancelled)

12. (Currently Amended) A method of making a diamond product by etching a diamond substrate, said method comprising the steps of:

etching said diamond substrate using a plasma of a mixed gas, wherein the plasma of the mixed gas comprises oxygen atoms, fluorine atoms, and nitrogen atoms;

generating a high-frequency discharge between two plate electrodes by supplying an electric power of less than 1.0 W/cm^2 between said plate electrodes; and

wherein the mixed gas has a fluorine atom concentration within the range of 0.04% to 6% with respect to the total number of atoms in said mixed gas, and

wherein said mixed gas contains nitrogen gas in an amount such that the intensity ratio A/B of said mixture is greater than the intensity ratio A/B of the mixed gas with no nitrogen, where A is the intensity of an emission peak caused by atomic oxygen and B is the intensity of an emission peak caused by molecular oxygen.

13. (Cancelled)

14. (Previously Presented) The method of claim 12, wherein the diamond substrate has a mask, and wherein the diamond product has an angle of inclination of at least 78 degrees.

15. (Previously Presented) A diamond product having a projection or a depression on a surface thereof, the projection or depression having at least one side face with an angle of inclination of at least 78 degrees.

16. (Previously Presented) The method of claim 1, wherein the mixed gas contains an N_2 concentration that is not less than 2.5% and not more than 40%.

17. (Currently Amended) A method of making a diamond product having a projection or a depression on a surface thereof by etching, said method comprising the steps of:

forming a diamond substrate with a mask layer including a metal layer in at least one part thereof; and

etching said diamond substrate formed with said mask layer with a plasma of mixed gas composed of a gas containing an oxygen atom and a gas containing a fluorine atom;

wherein said fluorine atom has a concentration within the range of 0.04% to 6% with respect to the total number of atoms in said mixed gas, said plasma is produced by generating a high-frequency discharge between two plate electrodes, said high-frequency discharge is generated by supplying an electric power of at least 0.45 W/cm^2 between said plate electrodes, said mixed gas further contains nitrogen gas, and the mixed gas contains an N2 concentration

that is not less than 2.5% and not more than 40%, thereby to form the diamond product having the projection or depression with a side face with an angle of inclination of at least 78 degrees, and

wherein said mixed gas contains nitrogen gas in an amount such that the intensity ratio A/B of said mixture is greater than the intensity ratio A/B of ~~pure oxygen~~ the mixed gas with no nitrogen, where A is the intensity of an emission peak caused by atomic oxygen and B is the intensity of an emission peak caused by molecular oxygen.

18. (Currently Amended) A method of making a diamond product having a projection or a depression on a surface thereof by etching, said method comprising the steps of:

forming a diamond substrate with a mask layer including a metal layer in at least one part thereof; and

etching said diamond substrate formed with said mask layer with a plasma of mixed gas composed of a gas containing an oxygen atom and a gas containing a fluorine atom;

wherein said fluorine atom has a concentration within the range of 0.04% to 6% with respect to the total number of atoms in said mixed gas, said plasma is produced by generating a high-frequency discharge between two plate electrodes, said high-frequency discharge is generated by supplying an electric power of at least 0.45 W/cm^2 between said plate electrodes, and said mixed gas further contains nitrogen gas, thereby to form the diamond product having the projection or depression with a side face with an angle of inclination of at least 78 degrees,

wherein said mixed gas contains nitrogen gas in an amount such that the intensity ratio A/B is not less than 2.5, where A is the intensity of an emission peak at a wavelength of 777 nm and B is the intensity of an emission peak at a wavelength of 558 nm, and

wherein said mixed gas contains nitrogen gas in an amount such that the intensity ratio A/B of said mixture is greater than the intensity ratio A/B of the mixed gas with no nitrogen, where A is the intensity of an emission peak caused by atomic oxygen and B is the intensity of an emission peak caused by molecular oxygen.